7 Stage 3 Standard Operating Procedure

7.1 Purpose

The primary purpose of Stage 3 (Final Design Process) is to execute the project development within scope, on schedule, and within budget. The needed input from Stage 2 into Stage 3 is a well-defined scope and preliminary schedule and an up-to-date budget for all aspects of the project.

For more complex projects, this information is contained in a Scope and Budget Memorandum approved by the Chief Engineer. Any significant changes to the project scope or budget must be submitted to the Chief Engineer for approval through the Program Manager. Changes to the budget may need to be brought before the Project Delivery Steering Committee, particularly if the Budget Partition is impacted.

The output of Stage 3 is signed final plans, specifications, and an approved estimate ready for letting. In addition, the rights of way should be purchased, all required agreements secured (utility, railroad, cooperative endeavor, etc.), and all environmental and non-environmental permits obtained that are required for letting. The completion of the above activities defines the project delivery date (PDD).

Implementation of the Program Project Management System (PPMS), using project scheduling software, provides a tool for effective management of project schedules, assigned resources, and the resulting cost to complete projects. The purpose of using PPMS is to enhance communication and coordination between staff engaged in project and program delivery at the project team, office, region, and statewide levels.

The challenge is to get the job done on time, within budget, and according to the agreed scope while meeting or exceeding customer and stakeholder expectations. At this point in the project delivery process, the development and function of the project team is critical for success.

Ongoing and active management of the project's "triple constraints" (scope, schedule, and budget as shown below) is a primary focus of project management.

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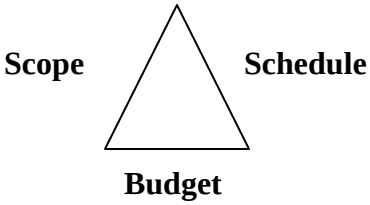

Key features of effectively managing project delivery include the following:

- Building an interdisciplinary team having the skills necessary for the project.
- Including the customers in the project delivery process.
- Communicating with all involved parties.
- Managing change.

Successful project delivery results from active project management and a team with the right resources that acts with a common purpose. The Managing Project Delivery process is applied by project managers and teams.

- Preparation – "Plan the Work"
- Execution – "Work the Plan"

While the assignment of organizations and individuals to a project is an essential first step, mere assignment does not result in an effective team. Teams must be built and sustained. For successful project delivery, the participants must conduct their efforts in a coordinated and complimentary manner. Establishing communication among the team member who will develop and deliver the project is the most important function of this first step of Managing Project Delivery. Successful project delivery starts with mobilizing the necessary resources and aligning all participants toward a common goal.

Building and sustaining an effective project team involves developing and constantly reinforcing a common understanding of:

- Project scope
- Team mission
- Participant roles and responsibilities
- Project boundaries
- Critical success factors

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The project team is a designated group of individuals working together with a common purpose related to a specific project. A critical aspect of project success is mobilizing and aligning individuals around a project to effectively deliver the product.

7.2 Process

The goal of the project team should be to develop a work plan that is comprehensive, realistic, deliverable, and endorsed by all team members. It is imperative to understand and communicate the distinction between the project work plan (including schedule and cost to complete) to accomplish the defined team mission and the effort to deliver the Highway Construction Program in terms of preliminary final engineering and right-of-way.

The scope of work, scheduled to deliver, and the estimated cost to complete a Highway Construction Program project (including engineering, right of way, utility, and construction phases) are developed by the project team during the scoping phase. Once a Highway Construction Program project's scope, schedule, and budget have been established, any change in scope, schedule or budget will require approval from the Chief Engineer through the use of change in the Scope and Budget Memorandum.

A project schedule is a systematic map of the hierarchical project tasks necessary to accomplish the team mission, taken to the lowest level of detail necessary to describe and assign the tasks. The team develops the project schedule with input from project customers and stakeholders. The project schedule includes all tasks necessary to accomplish the team mission.

The task activity list is attached for both a standard project as well as a summary project. The use of the standard or summary activity list is at the discretion of the project manager; however, the more complex projects should utilize the standard list and smaller, less complex ones should utilize the summary list.

A task is an assignable item of work that has:

- A definable beginning and end.
- A finite planned duration.
- A state of completion that can be estimated at any time.

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- A reviewable internal or external deliverable at the task's completion.

All projects in the Highway Construction Program are managed by a schedule of required activities that is based on the standardized master template and rules. The schedule to complete the team mission is developed from the work breakdown structure and the subsequent task planning. The schedule is a dynamic tool. It defines the start, order, and duration of project tasks and milestones. A collaboratively developed and comprehensive schedule is fundamental tool for the subsequent management and delivery of the project. It is used to communicate, coordinate, and measure project progress.

Successful project delivery requires active management of scope, schedule, and budget including the following:

- An endorsed base line scope, schedule, and budget.
- Ongoing communication with all team members to get frequent and accurate data on progress.
- Regular schedule and budget monitoring and evaluation with revisions to reflect actual progress, as appropriate.
- Regularly reporting progress to customers and stakeholders.
- Application of resources to meet schedule.

All projects in the department's Highway Construction Program will maintain current schedules in the PPMS and will be updated frequently to ensure the project delivery date shown in PPMS is accurate and can be met.

Significant milestones can be found in the Road Design Manual, Bridge Design Manual, and Program Management Manuals that are specific to the project.

Of these, the following are considered the major milestones:

1. Plan in hand meeting, PD0570
2. Joint Plan Review (R/W), FD0020
3. Advance check prints, FD0490
4. Value Engineering for high risk projects
5. Constructability Review

Each of these major milestones require, as outlined in existing design manuals, significant reviews, including field reviews, and cost updates.

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Recognizing and confronting change, rather than avoiding it, is key to successful project delivery. Value can be added through appropriate change management. In order to provide proper documentation, the Change Scope and Budget Memorandum should include the following sections:

- Project Overview- narrative of what the project is about.
- Original Project Scope- the project objective and scope.
- Change Project Scope- the revised objective ad scope.
- Reasons- identify reasons for the change in scope and budget.
- Environmental Requirements, Content Sensitive and Design Exceptions- outline any changes to the original environmental requirements, content sensitive and design exceptions.
- Project Schedule- indicates any changes in the original project schedule and major milestones.
- Budget and Funding- identify changes in the project funding or timing affected by the change in scope or budget.

See the following three pages for flowcharts representing the Stage 3 process: Stage 1 CE Summary Template, Stage 3 CE Summary Template, and Stage 3 EA/EIS Summary Template.

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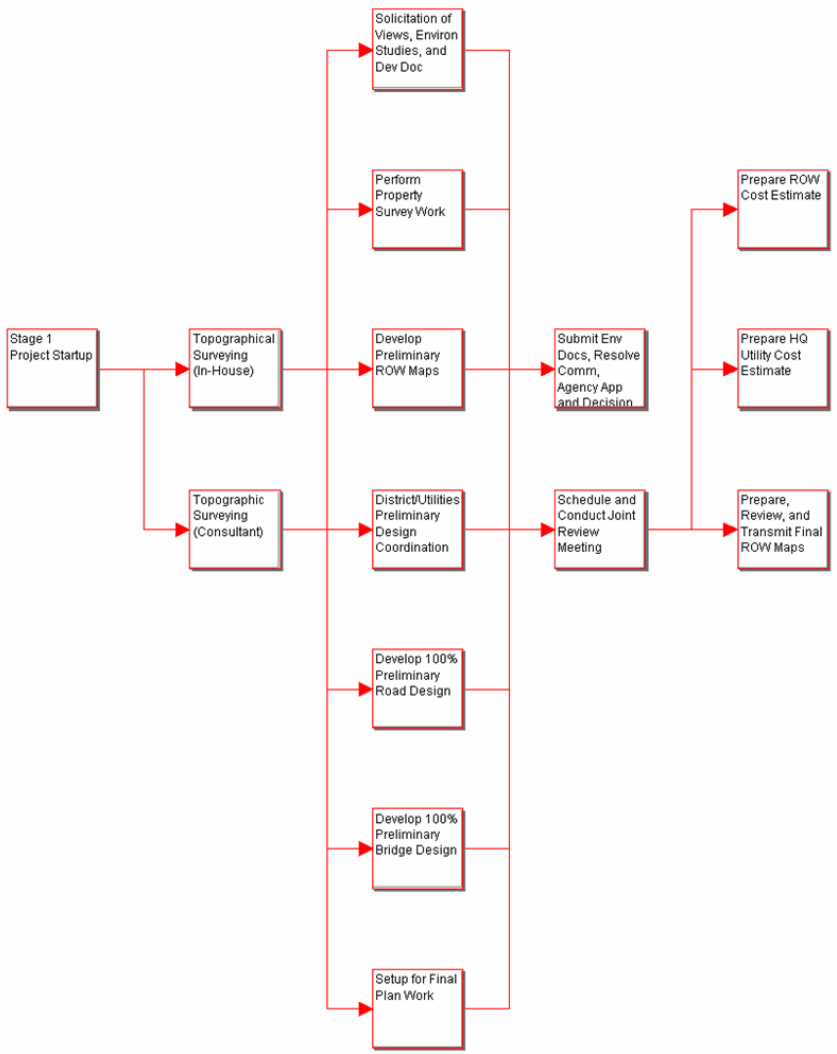
Stage 1 CE Summary Template



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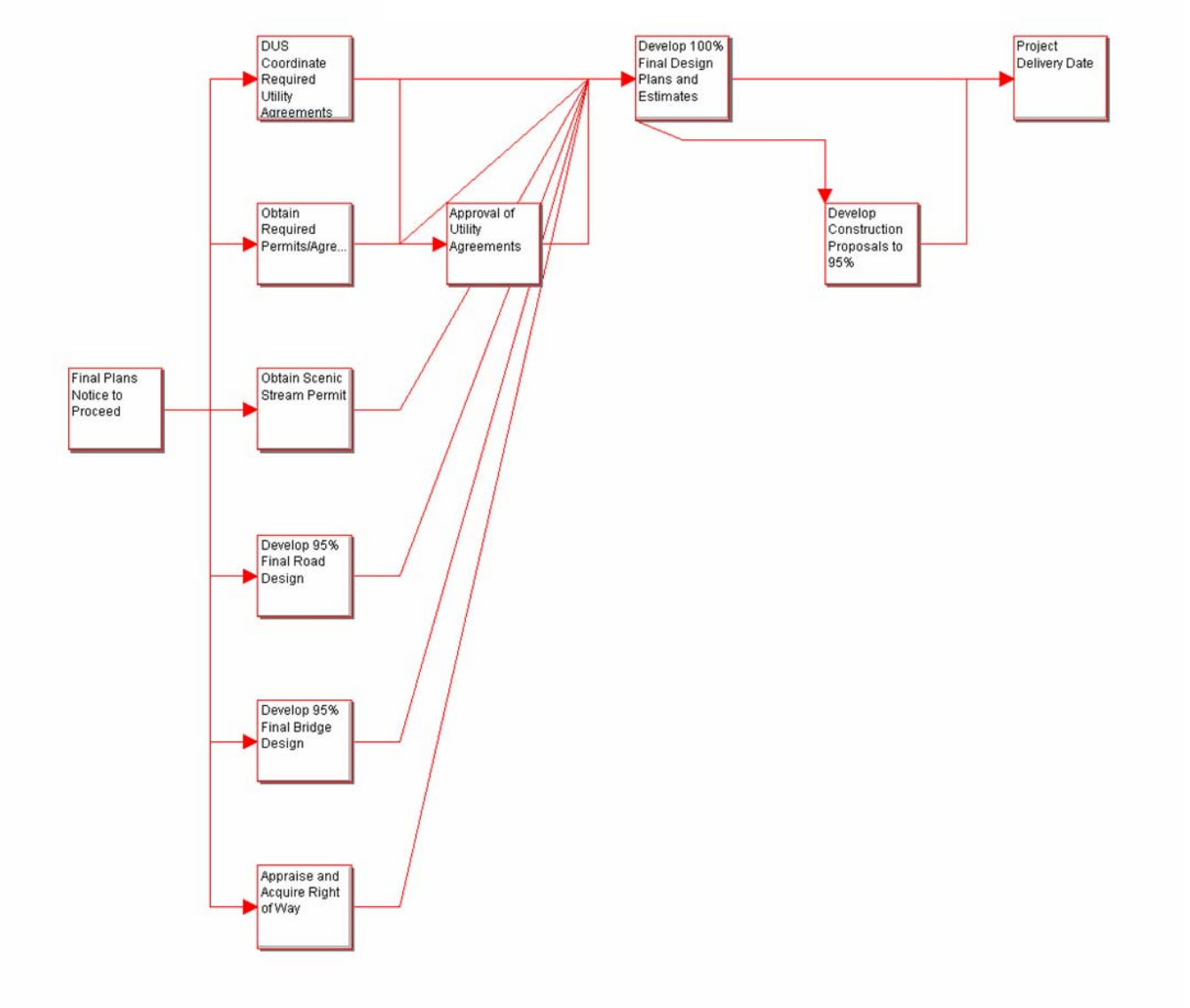
Stage 3 CE Summary Template



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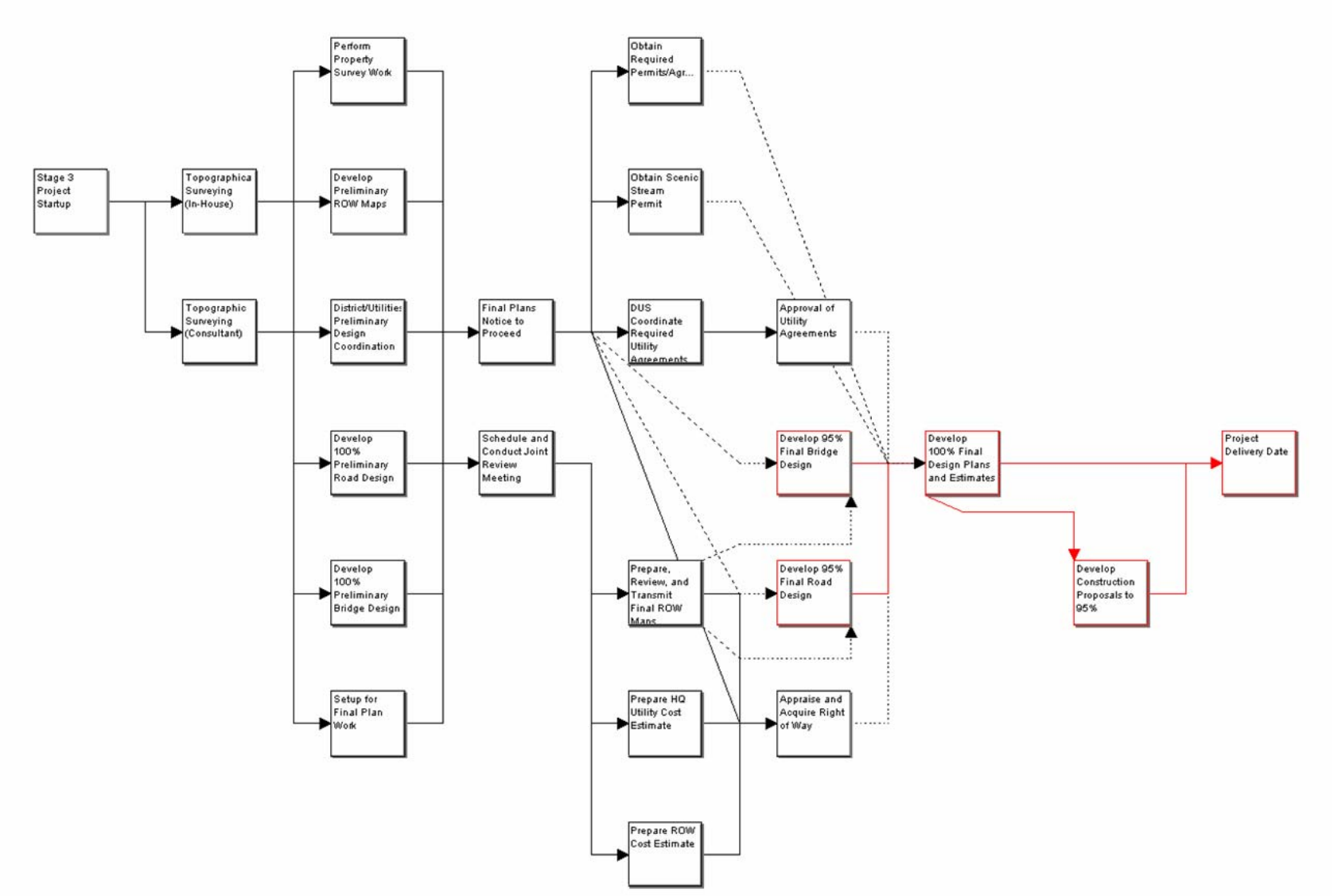
Stage 3 EA/EIS Summary Template



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7.3 Responsibility Matrix/ Checklist

Activity Description	Functional Responsibility
Compile Project Assessment Data	Project Manager
Prepare Scope and Fee Package	Project Manager
Prepare Consultant Advertisement	Consultant Contracts
Advertise and Select Consultant	Consultant Contracts
Prepare Original Contract	Consultant Contracts
Request and Rec. Fed. Auth. of Funds - Consultant Engineering	Project Control
Develop Notice to Proceed	Consultant Contracts
Assemble Project Management Team	Project Manager
Conduct Project Kickoff Meeting	Project Manager
Request Traffic Data	Project Manager
Develop Traffic Data	Planning and Programming
PM Requests Traffic Analysis	Project Manager
PM Requests Subgrade Soil, PH/Resistivity, and Pvmt Design	Project Manager
Perform Preliminary Traffic Analysis	Geometrics
Prepare and Distribute Predesign Form	Project Manager
Conduct Predesign Meeting	Project Manager
Request Topographic Surveys	Project Manager
Develop Preliminary Pavement Design	Pavement and Geotechnical
Develop Preliminary Life Cycle Costs Analysis (LCCA)	Pavement and Geotechnical
Perform Topographic Surveys	Location and Survey
Develop Digital Electronic Survey Package	Location and Survey
Pavement Review Committee Process	Pavement and Geotechnical
Request Subgrade Soil Survey	Pavement and Geotechnical
Make Topographic and Utility Information Available	Location and Survey
Perform Subgrade Soil Survey	District Lab Engineer
Preliminary Plans Notice to Proceed	Project Manager
Develop 30% Preliminary Design - Bridge	Bridge Design
Develop 30% Preliminary Design - Roads	Road Design
Coordinate Preliminary Design with Railroad(s)	Highway/Rail Safety
Order Subsurface Investigation for Project	Pavement and Geotechnical
Develop 60% Preliminary Design - Roads	Road Design
Furnish All Subsurface Investigation Data for Project	Materials and Testing Section
Develop Final Pavement Design	Pavement and Geotechnical
Develop 60% Preliminary Design - Bridge	Bridge Design
Compile 60% Preliminary Design	Project Manager
60% Preliminary Design Geometric Review	Geometrics
District Evaluation of Traffic Signals	District Traffic Engineer
Conduct 60% Preliminary Design Review - Roads	Road Design
Conduct 60% Preliminary Design Review - Bridges	Bridge Design

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Activity Description	Functional Responsibility
DUS Reviews/Confirms 60% Preliminary Design with Utilities	District Utility Representative
Environmental Solicitation of Views	Environmental
Prepare Work Effort for Property Survey	Location and Survey
Execute Supplemental Agreement	Consultant Contracts
Furnish Title Work and Perform Property Surveys	Location and Survey
Request Updated Titlework	Location and Survey
60% Preliminary Design Hyrdraulic Review	Hydraulics
Conduct Environmental Studies and Develop Document	Environmental
Update Titlework	Location and Survey
Decision on Traffic Signal Design	Traffic Engineering and Services
Address/Resolve General 60% Prel. Des. Review Comments	Project Manager
Develop Preliminary ROW Maps	Location and Survey
Submit Environmental Docs for Comments	Environmental
Address/Resolve Geometric 60% Prel. Des. Review Comments	Project Manager
DUS Distributes Preliminary Plans and Lists to Utilities	District Utility Representative
Address/Resolve Hydraulic 60% Prel. Des. Review Comments	Project Manager
Address/Resolve Agency Comments	Environmental
Distribute Preliminary ROW Taking Lines	Project Manager
Agency Approval of Documents	Environmental
Develop 90% Preliminary Design - Roads	Road Design
Develop 90% Preliminary Design - Bridge	Bridge Design
CE Selects VE Team, Team Performs Study and Makes Recom. to CE	Project Manager
Verify Topo - USTs, Contamination, Improvements	Real Estate
Review 90% Prel. Des. P/H - Roads	Road Design
Review 90% Prel. Des. P/H - Bridges	Bridge Design
Chief Reviews VE Recommendation	Project Manager
Address/Resolve 90% Prel. Des. P/H Bridge Comments	Bridge Design
Address/Resolve 90% Prel. Des. P/H Road Comments	Road Design
Distribute Plan-In-Hand Doc. for Review	Project Manager
Plan-In-Hand Meeting	Project Manager
Revise P/H Prel. Des. to Reflect Comments - Roads	Road Design
Revise P/H Prel. Des. to Reflect Comments - Bridge	Bridge Design
Prepare Fee and Scope Final Plan	Project Manager
Prepare Final Plan Supplement	Consultant Contracts
Schedule and Prepare for Joint Review Meeting	Real Estate
Conduct Joint Review Meeting	Real Estate
Final Plans Notice to Proceed	Project Manager
Develop 30% Final Plans - Roads	Road Design

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Activity Description	Functional Responsibility
Develop Traffic Control Plans	District Traffic Engineer
Develop 30% Final Plans - Bridge	Bridge Design
Prepare Final ROW Maps	Location and Survey
Prepare ROW Cost Estimate	Real Estate
Prepare HQ Utility Cost Estimate	HQ Utilities
Prepare Relo Letter and Agreements for Utility Co	District Utility Representative
Confirm Required Permits and Agreements List	Project Manager
Prepare C/S/I Applications for Required Agreements	Consultant Contracts
Prepare Railroad Applications for Required Agreements	Highway/Rail Safety
Prepare CE/CG/CZ Applications for Required Permits	Permits
Prepare Applications for Required Scenic Stream Permit	Environmental
Develop Final Plan to 60% - Roads	Road Design
Develop Final Plans to 60% - Bridge	Bridge Design
Request Funding for R/W Activities	Real Estate
Request & Rec Fed. Auth. of Funds - R/W & Utilities	Project Control
Review and Resolve Final ROW Map Issues	Location and Survey
Modify ROW Maps to Reflect Final Comments	Location and Survey
Utility Company Signs and Returns Project Package	District Utility Representative
Transmit Final ROW Maps to Real Estate	Location and Survey
Submit CE/CG/CZ Permit Applications	Permits
Submit Scenic Stream Permit Application	Environmental
Address/Resolve CE/CG/CZ Permit Comments	Permits
Address/Resolve Scenic Stream Permit Comments	Environmental
Request Appraisals	Real Estate
Address/Resolve C/S/I Agreement Comments	Consultant Contracts
Address/Resolve Railroad Agreement Comments	Highway/Rail Safety
Compile 60% Final Plan	Project Manager
Review 60% Final Plan - Bridge	Bridge Design
60% Final Plan Hydraulic Review	Hydraulics
60% Final Plan Traffic Engineering Review	Traffic Engineering and Services
Review 60% Final Plan - Roads	Road Design
Prepare Property Valuation	Real Estate
60% Final Plan Geotechnical Review	Pavement and Geotechnical
Finalize CE/CG/CZ Permits	Permits
Finalize Scenic Stream Permit	Environmental
Adjust Design for Permit Mitigation	Project Manager
Address/Resolve 60% Final Plan Review Comments - Bridge	Bridge Design
Address/Resolve 60% Final Plan Review Comments - Roads	Road Design
Finalize C/S/I Agreements	Consultant Contracts
Finalize Railroad Agreements	Highway/Rail Safety
Develop Final Bridge Design to 95%	Bridge Design

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Activity Description	Functional Responsibility
Develop Final Road Design to 95%	Road Design
Conduct Relocation Negotiations	Real Estate
Conduct Acquisition Negotiations	Real Estate
District Forwards Project Package to HQ for Review	District Utility Representative
HQ Utility Approval	HQ Utilities
Release Letter - Utilities	HQ Utilities
Distribute 95% ACP for Review	Project Manager
ACP Review Period	Project Manager
Address/Resolve ACP Comments	Project Manager
Remove Improvements from Right of Way	Real Estate
Certify Project R/W Activities Are Complete	Real Estate
Develop Final Plans to 100% Complete	Project Manager
District Issues Utility Work Orders	District Utility Representative
Prepare Final Estimate	Project Manager
Develop Final Life Cycle Cost Analysis	Pavement and Geotechnical
Develop Construction Proposals to 95% Complete	Contracts and Specifications
Signed by Engineering Chief	Project Manager
Develop Construction Proposals to 100% Complete	Contracts and Specifications
Request & Rec Fed. Auth. Funds - Construction	Project Control
Advertise Project	Contracts and Specifications

7.4 Deliverables

- Signed final plans included electronic formats
- Plan QC/QA Documentation
- Specifications and Proposal Package
- Approved estimate ready for letting
- Rights-of-way purchased
- Required agreements secured (utility, railroad, cooperative endeavor, etc.)
- All environmental and non-environmental permits obtained
- Estimate of construction duration

7.4.1 Performance Indicators

Performance indicators for Stage 3 concentrate on two components, budget and schedule. The major milestones listed above are to be used to track the budget and schedule. The performance indicator for budget and schedule is made at the completion of Stage 3.

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